

WHAT IS CLAIMED IS:

1. A method for treating a vascular disease or condition comprising providing to a cell an endothelial nitric oxide synthase (eNOS) comprising a TAT protein transduction domain, wherein the eNOS increases nitric oxide production in a cell.
2. The method of claim 1, wherein eNOS further comprises a hexa-histidine domain.
3. The method of claim 1, wherein the vascular disease or condition is heart disease, hypertension, diabetes, atherosclerosis, hyperlipidemia, erectile dysfunction or arthritis.
4. The method of claim 1, wherein the cell is a vascular cell.
5. The method of claim 4, wherein the vascular cell is an endothelial cell.
6. The method of claim 4, wherein the vascular cell is vascular smooth muscle cell.
7. The method of claim 1, wherein the cell is located in a cell culture.
8. The method of claim 1, wherein the cell is located in a tissue culture.
9. The method of claim 1, wherein the cell is located in the vasculature of a mammal.
10. The method of claim 1, further comprising detecting eNOS comprising a TAT protein transduction domain in a vascular cell by immunoblotting.
11. A method for detecting a vascular disease in a subject comprising: a) obtaining a vascular cell sample from a subject; and b) analyzing the cell sample for nitric

oxide production by endothelial nitric oxide synthase, wherein a decrease in nitric oxide production as compared to a vascular cell sample from a healthy subject, indicates a vascular disease.

12. The method of claim 11, wherein the subject is a mammal.
13. The method of claim 12, wherein the mammal is a human.
14. The method of claim 11, wherein the vascular cell sample is vascular smooth muscle cell sample.
15. The method of claim 11, wherein the vascular cell sample is a heart disease cell sample, a hypertension cell sample, a diabetes cell sample, a atherosclerosis cell sample or a hyperlipidemia cell sample.
16. The method of claim 11, wherein nitric oxide production is analyzed by a nitrite assay.
17. The method of claim 11, wherein nitric oxide production is analyzed by a nitrate assay.
18. The method of claim 11, wherein nitric oxide production is analyzed by a cGMP assay.
19. The method of claim 11, wherein the nitric oxide production is analyzed by monitoring blood pressure, blood flow, and improvements in vascular reactivity.
20. A method for treating a subject having a vascular disease or condition comprising administering to the subject a therapeutic effective amount of an endothelial nitric oxide synthase comprising a TAT protein transduction domain.

21. The method of claim 20, wherein the subject is a mammal.
22. The method of claim 21, wherein the mammal is a human.
23. The method of claim 20, wherein the vascular disease or condition is heart disease, hypertension, diabetes, atherosclerosis, hyperlipidemia, erectile dysfunction or arthritis.
24. The method of claim 20, wherein administering is intravenously, intraarterially, subcutaneously, orally or topically.
25. A method for assessing the efficacy of eNOS comprising a TAT protein transduction domain as a vascular cell therapy comprising:
 - a) administering a endothelial nitric oxide synthase protein comprising a TAT protein transduction domain to a subject having a vascular disease or condition; and
 - b) determining nitric oxide production;wherein an increase in the nitric oxide production as compared to the nitric oxide production in a vascular cell prior to administering eNOS comprising a TAT protein transduction domain, indicates that the vascular cell therapy is effective.
26. The method of claim 25, wherein nitric oxide production is determined by a nitrite assay.
27. The method of claim 25, wherein nitric oxide production is determined by a nitrate assay.
28. The method of claim 25, wherein nitric oxide production is determined by a cGMP assay.

29. The method of claim 25, wherein the nitric oxide production is determined by monitoring blood pressure, blood flow, and improvements in vascular reactivity.
30. The method of claim 25, wherein the vascular disease or condition is heart disease, hypertension, diabetes, atherosclerosis, hyperlipidemia, erectile dysfunction or arthritis.
31. The method of claim 25, wherein the vascular cell is a vascular smooth muscle cell.
32. The method of claim 25, wherein the vascular cell is an endothelial cell.
33. An endothelial nitric oxide synthase comprising a TAT protein transduction domain.
34. The endothelial nitric oxide synthase of claim 33 further comprising a hexahistidine domain.
35. A pharmaceutical composition comprising an endothelial nitric oxide synthase containing a TAT protein transduction domain.